

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

Claim 3 has been canceled, and new claims 4-6 have been added. Claims 1-2 and 4-6 are pending in this application.

Claims 1 and 3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Puchner et al. taken with Shih et al. Applicant traverses the rejection for the following reasons.

Applicant submits that the prior art cited by the Examiner neither discloses nor suggests most of the features of the claimed invention. In particular, the prior art fails to disclose or suggest the step of performing an additional ion implantation process to form an additional ion implantation layer on sidewalls of the trench. While Puchner et al. discloses a feature of implanting indium ion at the bottom of the trench, Puchner et al. clearly fails to disclose or suggest the feature of forming an additional ion implantation layer on the sidewalls of the trench.

It is also submitted that the prior art is moot in describing or teaching the step of performing a well ion implantation process to form a well ion burial layer in a given depth of the semiconductor substrate.

As the prior art fails to disclose or suggest the feature of forming the well ion burial layer, it is clear that the prior art also fails to disclose or suggest the step of forming a well within the semiconductor substrate by an annealing process to diffuse the impurity ion in the well ion burial layer and the additional ion implantation layer.

Further, according to the claimed invention, the additional ion implantation process and the well ion implantation process used the same type impurity ion. In contrast, the Puchner patent discloses boron ion for the P-well ion and indium ion implanted at the bottom of the trench. Therefore, Puchner et al. further fails to disclose or suggest the same type impurity ion.

It is submitted that Shih et al. does not supply the above-noted deficiencies of Puchner et al.

Therefore, claim 1 is not made obvious over Puchner et al. taken Shih et al. under 35 U.S.C. §103(a).

Claim 2 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Puchner et al. and Shih et al., as applied to claims 1 and 3 above, and further in view of Fuse et al. Applicant traverses the rejection for the following reasons.

After a careful study of Fuse et al., Applicant submits that Fuse et al. does not supply the above-noted deficiencies of Puchner et al. and Shih et al. Accordingly, Applicant submits

that claim 2, which is dependent on claim 1, is patentable for the reasons discussed above with respect to claim 1, as well as on its own merits.

Applicant submits that new claim 4 defines further limitation that the ions are implanted in a tilt so that the ions are implanted only on the sidewalls of the trench. Accordingly, claim 4 should be allowable for the same reasons discussed above with respect to claim 1. Claims 5-6, which are dependent on claim 4, should be also allowable.

All objections and rejections having been addressed, it is respectfully submitted that claims 1-2 and 4-6 are now in condition for allowance and a notice to that effect is earnestly solicited. If any issues remain to be resolved, the Examiner is cordially invited to telephone the undersigned attorney at the number listed below.

Respectfully submitted,
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Atty. Dkt.: **123034-05004909**
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